The Macdonald Journal

FEBRUARY 1982

SPECIAL DAIRY ISSUE

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At the Secretary of State, we've received some very good ideas from Quebec's anglophone communities. And, we've helped them grow. Here are just a few of the projects that the Secretary of State has been associated with last year:

- a conference for Quebec's English-speaking youth. Young Quebecers from every part of the province came together to discuss the difficulties and challenges facing Quebec's anglophone youth;
- an arts and crafts exhibition and tour that allowed local Gaspé artisans to display their works in other English-speaking communities throughout the region;
- a workshop that brought members of the province's 13 Quebec Young Farmers clubs together to develop leadership skills and to share ideas;
- a project by Youtheatre to bring live theatre to children in 90 communities in remote areas of the province;
- and many, many more.

In the course of funding these projects, we've developed a good idea of just how vital Quebec's anglophone communities really are, and how important they are to Canada's cultural heritage. A good idea deserves to grow.

A good idea deserves to grow.

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In This Issue

Editorial

How to Get 80 Per Cent Participation in Milk Recording

The dairy industry as a whole has adopted the main objective of the Second National Conference on Milk Recording, held in October 1980, which is to have an expansion of producer participation in milk recording to the level of 80 per cent of the national herd by 1990. This is twice the national level of participation in 1980. For Quebec it is an even greater challenge. It remains somewhat of a mystery as to why the Province of Quebec, which is recognized for having the best milk recording program in Canada, has the second lowest provincial participation level (36.1% in 1980). To attain the Conference's objective Quebec is responsible for two-thirds of the required national effort. Assuming a 25 per cent reduction in the total number of herds in the next decade, Quebec needs to have a net yearly increase in milk recording enrolment of about 525 new herds. As in all other provinces two main problem areas need to be looked at to permit such expansion.

The first one is financing of the program. The present producer fee is likely a key element of the low participation in Quebec as it is higher than in most other provinces since the Quebec government's share of the total cost of the program is among the lowest in a provincial milk recording program. On the one hand, it is sad that the government has chosen to reduce its contribution towards the milk recording program at a time when the industry is hoping to expand the program. On the other hand, it provides an opportunity to producers to get more involved in the program. This is not to say that moral and financial support from the government are not important. On the contrary, they are necessary for the success of the program. In many cases producers' support and the importance they attach to a certain program will determine the degree of participation of the provincial government.

It would be unrealistic for producers to assume a reduction in the cost of the program when more and better services are requested and when a major expansion is planned for.

There are three major beneficiaries of the milk recording program which also represent the sources of funding. There is, of course, the producer-user who benefits directly from the program through increased efficiency in his herd management which, in turn, reduces his cost and, through greater production due to genetic gains, increases his returns. There is also the dairy producer population as a whole — whether on test or not — which benefits from the availability of sires with genetic potential much greater than would otherwise be possible without milk recording programs. Finally, it is clear that any productivity improvement is transmitted to consumers through a reduction in cost of production which translates into lower prices for dairy products. As a representative of consumers, government has some responsibilities towards the milk recording program. Particularly needed is a long-term commitment towards such programs. Producers as a whole could support the program through a check-off system on all milk deliveries as adopted (and implemented) last year in Ontario. Not only is such a check-off a justifiable source of financial support but it also becomes an incentive for producers to enrol in the program. Finally, the producer-user will need to realize that fee increases will be required for an expansion in the program. Different studies show that for every dollar invested in a milk recording program between $6 to $9 of

net benefits can be expected. While these net benefits are shared among the three beneficiaries mentioned, there is every indication that there is a lot of room before the costs of the program outrun the benefits.

The second major problem area which can limit expansion of milk recording is the structural aspect of the programs. What is required is a structure flexible enough to react quickly to necessary changes as well as being adaptable to the type of work and personnel involved in milk recording. The structure also needs to permit the involvement of producers in the decision-making process related to the program.

Since the 1980 Conference, producers in all provinces took it upon themselves to ensure that the Conference's objectives would be met. Provincial milk recording committees were set up by producers' organizations in order to review in detail the requirements for meeting such objectives and to develop and work towards implementation of policies which would permit the expansion aimed for by the industry. A tremendous amount of work was done by these committees during 1981, and the Quebec committee has been no exception. In Quebec representatives from dairy producers' organizations, breed associations, the provincial government, Dairy Herd Analysis Service (DHAS, Macdonald College), and the AI Centre discussed ways and means to unify existing programs and fund them and looked at ways to implement the changes required in the administrative structure. It is hoped that the committee will be able to present its recommendations in the early part of 1982. In view of the challenge, one can anticipate the need for such recommendations to be ambitious. It should not come as a surprise that producers will be asked for greater financial support. The past policy of not even increasing producer fees by as much as costs had increased cannot be relied on to be continued. It would be a mistake on the part of producers to let themselves be impressed or scared by large increases rather than rationalizing the invaluable benefits of the program. Their best avenue will actually be to promote the program among all other producers.

Richard Doyle,
Assistant Executive Secretary,
Dairy Farmers of Canada

HOUSING YOUR FUTURE DAIRY HERD

By Professor Elliott Block
Department of Animal Science

Many dairymen fail to recognize the need for paying as much attention to replacement heifers as they do to their milking animals. It is sometimes felt that these animals will not be profitable until they calve at about 24 months of age and therefore do not need the attention that a cow producing 9000 kg of milk needs. What we all fail to realize at times is that a heifer-calf born today may just be our future 9000 kg record. Aside from nutrition and genetics, the environmental conditions that the heifer is subjected to can affect her future production capacity through survival, growth, thriftiness, and resistance to diseases. This article is written to give a better understanding of the needs of calves and heifers with regard to physical facilities.

Calves and Young Stock

What is required in housing the calf? There are basically three different housing systems; warm housing, cold housing, and outdoor calf hutches. The needs of the calf remain the same in all three systems. A calf need clean, dry facilities in which it can grow while minimizing the labour (not to be confused with attention) required. The most critical period in a calf's life is the first four months. Mortality frequently runs 20 per cent or more during this time, mainly due to respiratory problems and scours. Seventy-five per cent of these deaths can occur in the first two weeks of life. This is the period where we should be most concerned. Exposing newborn calves to sharp changes in temperature, damp drafts, or wet and humid conditions are major contributing causes of sickness and death. To help prevent these losses, start calves in the best possible environment. Here is a checklist of management procedures; how many do you follow?

Put the calves in individual pens or stalls for their first six weeks;

Provide a clean, dry, draft-free environment for the newborn calf;

Feed colostrum immediately after birth, preferably within 30 minutes;

Use a generous amount of clean dry bedding and replace frequently, especially in cold-type housing;

Provide clean fresh water;

Design facilities for easy cleaning and sanitizing and follow a regular and frequent cleaning schedule;

Keep milk feeding utensils and replacer mixing equipment clean;

Keep weaned calves in small group pens of seven or less, with no more

than a two or three month age difference between calves in a pen;

Store pre-mixed feeds, hay, grain, and bedding in a handy location;

Separate sick calves from others;

Plan a vacant period of several weeks in your calf barn for yearly cleaning, sanitizing, and airing-out.

Complete and thorough planning is very important to successful calf housing. Determine calving intervals, numbers to be kept, and how long they will stay in the calf barn. Use this information and space requirements (given later in this article) to size the calf barn for your herd. Design to get maximum use of a calf barn.

Calves can survive and perform well in both cold and warm-type housing if the system is properly designed and managed.

Temperature, Humidity, and Ventilation

Many producers do not realize that above-freezing temperatures are **not** a requirement for successfully raising calves. Often, calves can be raised in below-zero climates (even in outdoor hutches) but are housed in a manner to remove excess moisture and prevent an "ice-box" condition while calves are free of direct wintry blasts. The only reasons that a 2 to 7°C environment may be preferable to a freezing environment are that: drinking water will not freeze; less bedding is required; you or the caretaker is more comfortable. Please note that none of these reasons has anything to do with calf health or survival. Too many calf barns are too warm with insufficient ventilation. Calves that are conditioned to a 21°C environment tend to be more susceptible to drafts and cold when placed outside at a later date.

This discussion is not meant to discourage heating a calf barn. In some areas supplemental heat is required to reduce humidity. Wet, humid conditions are always to be avoided. Dampness of the calf's coat, damp floors, and damp bedding contribute to easy calf chilling even when the temperature is above zero. The indiscriminate use of the water hose can do more harm than good; the calf's environment may be clean, but the wet floor, walls, bedding, and calf coupled with a minimum draft creates this "ice-box" condition previously mentioned. Figure 1 is a graph of the water holding capacity of air at various temperatures and relative humidities. We should always strive to keep humidity below the dew-point (moisture condensation on walls and ceilings). Let us determine what this graph means and how to use it.

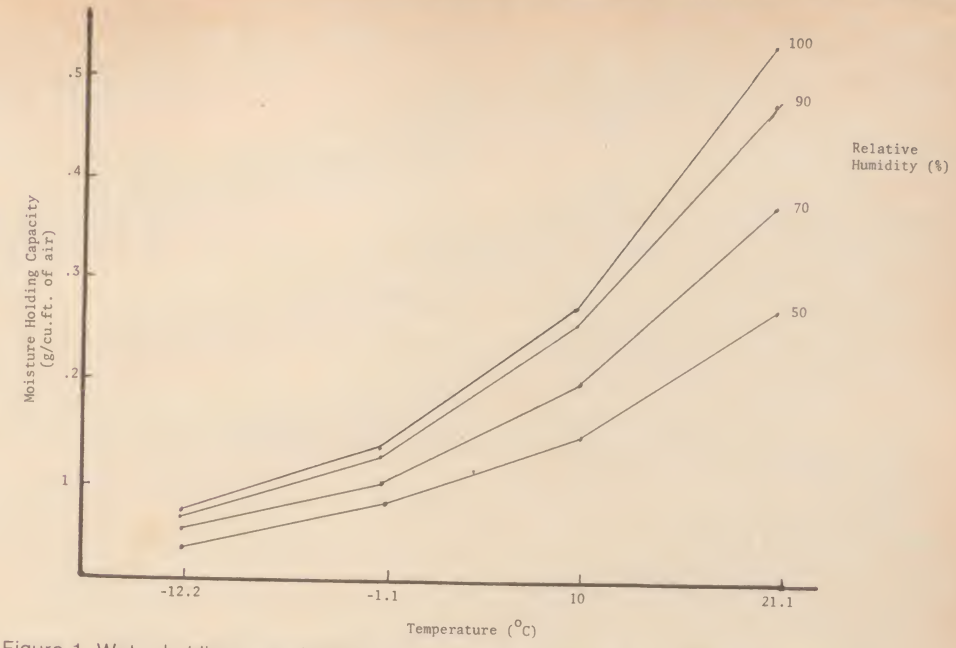


Figure 1. Water holding capacity of air at various temperatures and relative humidities.

As tne name implies, relative humidity is a relative term. Relative humidity of 100 per cent at 21°C means that at 21°C the air is holding as much water vapour as possible, which is about 0.5 grams of water per cubic foot of air (Figure 1). At 10°C and 100 per cent relative humidity the air again is saturated but at only 0.3 grams of water per cubic foot of air. Our object should be to either decrease humidity or decrease the amount of water in the air. Using Figure 1 we see that at low temperatures (-1°C) and high humidity (90 per cent) we can either add heat which would keep the moisture in the air the same (1 gram/cubic foot) but will decrease the relative humidity or increase ventilation of less humid, colder air from outside the barn which will decrease temperature thereby decreasing both humidity and moisture holding capacity. At high temperatures and high humidity the same possibilities exist.

Many dairymen start calves in "warm" housing and move them when two months old to "cold" housing. Others start calves in "cold" housing. Ventilation is required in any closed calf barn.

Cold Housing Natural air movement ventilates cold barns. They are usually lightly insulated buildings such as pole barns. Insulation in cold barns controls condensation and frost formation on inside surfaces and reduces summer heat build-up.

Various air inlets and oulets are used with natural ventilation. Which one to use depends on building size, wind, and snow problems. A suitable air outlet for small buildings of 10 x 13 metres may be a louvered vent in each end wall gable. The louvered area should provide approximately 1 cm^2 per 12 cm^2 of building floor space. An open ridge, as shown in

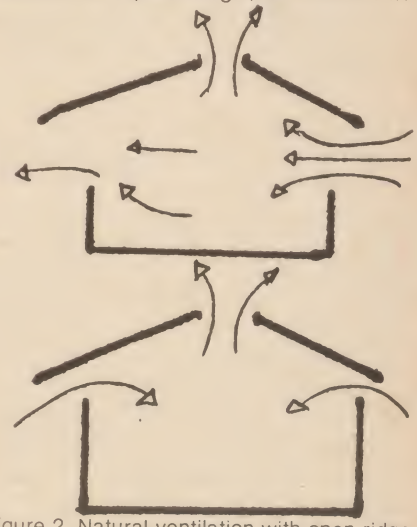


Figure 2. Natural ventilation with open ridge in cold housing for summer (above) and winter (below).

Figure 2, is common in cold loose housing and free stall barns. Table 1 lists recommended opening widths. Sideboards along an open ridge reduce snow sifting inside.

Roof-type ventilators such as wind rotators and adjustable types are available. Consider the initial cost and the number needed; also consider that these ventilators usually fill with dust, birds' nests, or frost and do not provide as much air movement as open ridges. However, they do keep snow and rain out of the barn.

Warm Housing Warm housing refers to barns built to maintain a uniform temperature in the winter; it may be part of an existing barn or a separate building. If the calf barn is part of a stall or free stall barn, be sure to partition the calf area from the milking herd. In all cases, warm barns should be insulated, mechanically ventilated to minimize heat loss in winter, and heated.

In either "warm" or "cold" buildings calves should be kept in individual elevated tie-stalls (61 x 122 cm) with slatted floors or individual floor pens (122 x 122 cm) with bedding until weaning. The reason for keeping calves separate is to minimize contact between calves in case a disease problem develops. A common problem with the elevated, slatted floor tie stalls is keeping drafts from coming up under the calves.

The mechanical ventilation in a warm calf barn is needed to circulate air, remove moisture, and to exhaust extra heat. A minimal amount of exhaust is needed in winter for moisture removal and a maximum is needed in summer for heat removal.

In the dead of winter it is recommended that any warm calf barn have approximately four air exchanges per hour; in the fall and spring or any time when the barn temperature may rise to 10° to 12°C, 12 air exchanges per hour are needed; in the summer as many as 24 air exchanges per hour are needed to prevent heat stress in young calves. For yearling heifers and dry cows Table 2 shows the required exhaust capacity needed per animal. Note that the fan requirements are in CFM (cubic feet of air moved per minute).

Table 1. **Recommended minimum open ridge sizes**

Building width (metres)	7.3	9.1	12.2	15.2	18.2	21.32	24
Open ridge size (centimetres)	*10.2	*12.7	15.2	20.3	25.4	30.5	35

*15.2 cm minimum in cold climates to prevent frost blockage

Table 2. **Recommended for capacity, cubic feet per minute (CFM) per yearling heifers and cows.**

Breed	Winter		Summer	
	Yearling	Cow	Yearling	Cow
	CFM fan capacity/animal			
Holstein	75	150	150	300
Guernsey	50	110	100	220
Ayrshire	55	115	110	230
Jersey	50	100	100	200
Brown Swiss	70	140	140	280

1 — Assume barn size of 9.1 x 13.4 x 2.4 (ceiling) metre barn

2 — Convert to feet because many fans are in imperial measures (ie. CFM)

a — therefore 30 x 44 x 8 foot barn

b — total barn volume = 30 x 44 x 8 = 10,560 cubic feet

c — minimum rate (winter) — 4 exchanges/hr. or one exchange every 15 min.

$$\frac{10{,}560 \text{ cu. ft.}}{15 \text{ min.}} = 700 \text{ CFM required}$$

d — normal rate at 10°C — 12 exchanges/hr. or one exchange every 5 min.

$$\frac{10{,}560 \text{ cu. ft.}}{5 \text{ min.}} = 2100 \text{ CFM required}$$

e — summer rate — 24 exchanges/hr or one exchange every 2.5 min.

$$\frac{10{,}560 \text{ cu. ft.}}{2.5 \text{ min.}} = 4200 \text{ CFM required}$$

FAN NEEDS

1 — One **700 CFM exhaust fan running continuously** located near the floor to conserve heat.

2 — One **1400 FCM exhaust fan thermostatically** controlled to operate when inside temperature exceeds 10°C (note that total fan capacity is 1400 + 700 CFM = 2100 CFM)

3 — One **2100 CFM exhaust fan** located on south or east wall to run only in hot weather (Note that total exhaust is 700 + 1400 + 2100 CFM = 4200 CFM)

Figure 3. Example exhaust system for warm calf barn.

The air inlet system is as important as the exhaust system. Commonly, barns are designed to allow air to enter from the attic through a slot at the junction of the ceiling and the wall. The air inlet should be on the wall opposite the exhaust. Figure 3 has an example for calculating the ventilation required in a 9.1 x 13.4 x 2.4 metre calf barn.

There are many types of ventilation systems: some examples are given in Figures 4, 5, 6 and 7.

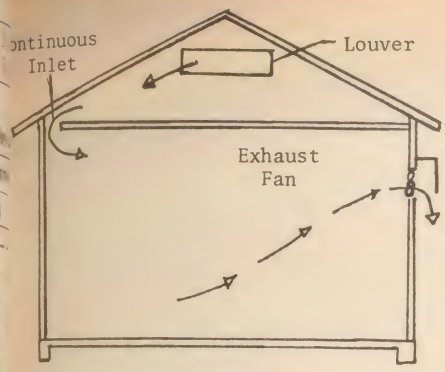
Warm barns should be kept at about 10°C in the coldest weather. For temperature and moisture control, there are two additional requirements to the ventilation and heating system: 1 — insulation; 2 — vapour barriers.

Insulation Any material that reduces the rate of heat flow from one area to another is an insulator. Insulation has several functions:

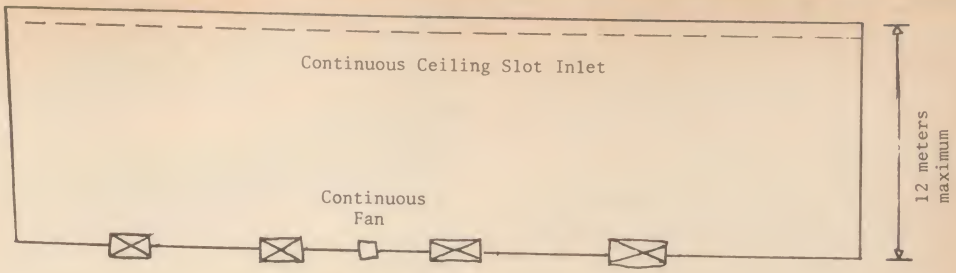
1 — Conserves heat in cold weather;
2 — Reduces heat gain in hot weather;
3 — Controls condensation on the inside surface;
4 — Foundation insulation also reduces frost heaving.

All materials resist heat passing through them. The resistance of a material is indicated by its insulating value ("R" value). Table 3 lists the R values for various materials with good insulators having higher R values. The insulating value of a wall or ceiling is the total of the "R" values of its components, i.e., insulation, siding, lining, and air spaces. In our climate an insulation value of R = 14 to 18 in walls and R = 23 to 28 in ceilings is recommended. Insulate outside of foundation wall to keep the walls, foundation, and floor warmer and to reduce condensation and hazard of frost heaving. Protect the foundation insulation with flashing and asbestos cement board against water, rodents, and physical damage (Figure 8).

The type of insulator chosen not only depends on its R value but also

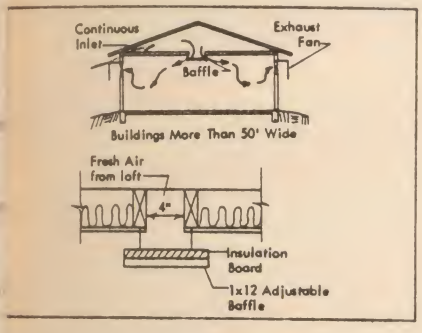


Building less than 12 meters wide

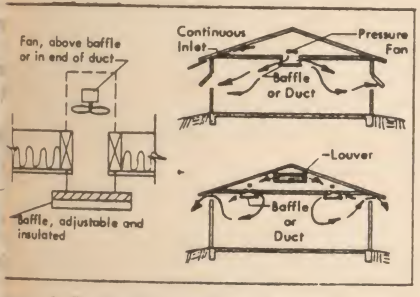


Thermostatically Controlled Fans

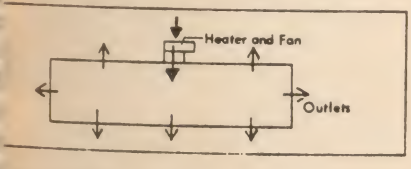
Figure 4. Left and above: Continuous inlet exhaust ventilation system.



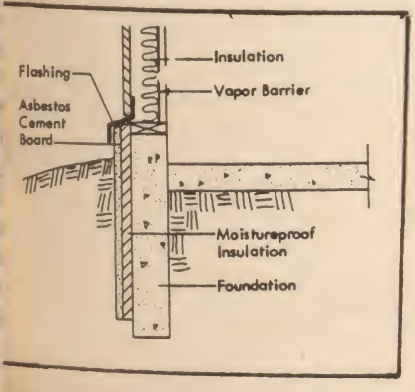
igure 5. Centre slot air inlet system.



gure 6. Pressure ventilation system. Note: exhaust fans used; fresh air is forced into arns.



gure 7. Pressure ventilation system with eater on air-intake fan.



ure 8. Example of foundation and rimeter insulation. See text for details.

Table 3. **Insulation R values for some common materials**[1]

Material	Insulation (R) value[2] Per inch thickness	For thickness listed
— Batt or blanket insulation, glass wool, mineral wool or fibreglass	3.50 approx.	
— Fill type insulation glass or mineral wool	3.00	
Vermiculite (expanded)	2.13-2.27	
Shavings or sawdust	2.22	
Paper or woodpulp	3.70	
— Ridge insulation		
Wood fibre sheathing	2.27-2.63	
Expanded polytyrene extruded	4.00-5.26	
moulded	3.57	
Expanded polyurethane (aged)	6.25	
Glass fibre	4.00	
— Building materials		
concrete, poured	.08	
plywood, 3/8''	1.25	.47
plywood, 1/2''	1.25	.62
hardboard, 1/4''	1.00-1.37	.25
cement asbestos board, 3/8''		.03
lumber (fir, pine), 3/4''	1.25	.94
wood bevelled siding, 1/2''x8''		.81
asphalt shingles		.44
wood shingles		.94
— Window glass		
single — glazed		.88
single — glazed + storm windows		1.79
double-pane insulating glass		1.45-1.73
— Air space (3-3/4'' or larger)		.90

[1]From ASHRAE Handbook of Fundamentals, 1972
[2]Mean temperature of 23.8°C.

on whether it is used for structural strength, relative cost, and the potential fire hazard. Common insulation is porous and lightweight with countless air spaces. The lighter the material is, the better its insulating value.

Vapour Barriers When relative humidity is high, insulation needs protection with vapour barriers. Water vapour moves from the warm side through a wall or ceiling to the cold side. Water vapour entering the wall may condense inside when it reaches a cold area. Moisture in the wall reduces the R value of insulators and can cause wall deterioration.

An effective vapour barrier on the warm side of the insulation provides a permanent moisture-proof seal. The most common vapour barrier is 4-mm polyethylene. Ridge insulation boards with built-in vapour protection require vapour-proof caulking or pressure-sensitive tape to seal joints.

Calf Hutches

The first reaction of many dairymen to the use of calf hutches is ''It is too cold in Quebec to raise calves from birth outside''. This is simply not true. It is true that some areas are too humid to raise calves outside (i.e., some areas of the Gaspé). Climatic conditions in parts of the United States are very similar to ours (New England, Minnesota, the Dakotas, and the State of Washington), and researchers have shown that calves can be raised

successfully, outdoors, in these areas. If the basic calf requirements are met (clean, dry, draft-free), you should have minimal problems raising calves in outdoor hutches.

The advantages of hutches are the low cost, the ease of cleaning (simply pick them up and move them to clean), the ease of moving them, and the natural ventilation. The only disadvantages are the higher bedding requirements and the undesirable working conditions due to the weather. During the winter months calves may need slightly more feed when housed outdoors because of their higher energy requirement to maintain body temperature; however, growth rate is very close to calves raised indoors. Depending on conditions, calf survival rate may improve in outdoors hutches due to less contact between calves and because the same air is not being circulated around all calves; these reasons lessen the chances of cross-infecting calves.

Breaking the Disease Cycle

Vacating the calf facilities allows for cleaning, sanitizing, major repairs, painting, and, hopefully, breaking any disease cycle. If you are using outdoor hutches, this is a rather simple task — simply move the hutches to a different location. If you have indoor facilities, there are two ways to vacate the barn: 1) have a sufficient numbers of pens, preferably in two different facilities so that each can be idle for a six-week period (or longer), and 2) have a secondary, temporary facility available in the slack calving season to use instead of the barn. This facility can also be used to relieve overcrowding in the peak calving season. An example of a temporary facility is 122 x 183 cm pens in a three-sided machine shed open to the down-wind side. The sides need not be solid in summer. In winter plywood or baled straw with a plywood top is sufficient.

Economic Considerations of Warm and Cold Housing

Table 4 shows some estimated costs of raising animals to yearlings in warm and cold confinement housing. Notice that the costs are approximately the same. Although cold housing saves money on power, housing, and equipment, more money is spent on feed and bedding. The choice of confinement housing is, therefore, a matter of preference. Outdoor hutches for calves to weaning followed by outdoor lots with sheds for older calves and heifers would be slightly less expensive than confinement housing because of the much lower building costs. However, bedding and feed costs for outdoor systems would be higher than indoor cold housing.

Calf hutches can be used in Quebec — even in winter!

Prefabricated Housing

You can find complete calf-raising facilities, prefabricated, on the market under many trade names. These units look like mobile homes from the outside. Inside they usually contain a sink and drain, ventilation system, individual calf tie stalls with slatted floors, a storage space, and a manure pit under the slats. All you have to do is hook it up to water and electrical supplies and you are in business.

Calves can be raised quite successfully, at least until weaning, in this type of unit. However, personal experience with three different brands of this type of unit has led me to the conclusion that the working conditions for caretakers are highly undesirable. The units are small with narrow alleys, and it is, therefore, difficult to manoeuvre feed, milk, and buckets; the odours inside the units are quite strong and are at times unbearable for workers, although the calves do not seem to mind these odours too much and, lastly, although not as important, there are no windows in these units and this, coupled with the cramped quarters, makes going inside a bit unpleasant.

GENERAL SUMMARY (MANAGEMENT AND HOUSING)

A. Birth to Weaning

1. Feeding recommendations
   a. feed colostrum as soon as possible after birth;
   b. offer calf starter within the first 1-1/2 weeks;
   c. feed milk at eight to 10 per cent of birth weight; feed replacer at same rate or

Table 4. **Estimated costs of warm *vs* cold confinement (enclosed) housing per yearling anima per year.**

Item	Warm confinement	Cold confinement
Feed cost[1]	$167.90	$177.00
Bedding cost[2]	0.00	24.00
Breeding fees[3]	9.40	10.25
Power, misc	20.00	6.50
Veterinary and medication	3.60	3.75
Housing equipment[4]	100.00	50.00
Labour[5]	51.85	48.20
Total/yearling/year	$352.75	$319.70

[1]Calculated at 5.5 cents/kg forage dry matter.
[2]Calculated at 2.2 cents/kg.
[3]Based on $5/unit of semen.
[4]Building amortized over 20 years at 12%.
[5]Based on $5/man hour.

according to recommendations;
d. offer high quality hay by two weeks of age;
e. offer water free choice by the end of the second week (sooner if desired);
f. wean when calf is consuming at least 0.5 kg of starter, grain mix, or total ration dry matter daily.

2. Housing recommendations
a. individual tie stalls or pens: tie stall should be 61 x 122 cm floor area; add 30 cm to length for feed box. Floor pen should be 122 x 122 cm; sides of 122 cm in height;
b. an alternative is to tie calves (tether) to a wall with feed box in front and bedding on floor; this will also serve to teach calves to respect confinement;
c. if using elevated stalls with slatted floor, keep calves for one to two weeks in floor stall or pen with bedding before moving to elevated stalls; since newborn calves have weak legs, this may prevent leg and hock damage.

3. Weaning to Four Months

1. Feeding recommendations
a. continue calf starter or grower with average to good quality hay;
b. calf starter or grower fed up to 1.8 kg per calf daily.

2. Housing recommendations
a. indoor pens: 6 m^2 of floor space: no more than seven calves per pen; add 2.5 m^2 of floor space per calf for each calf over seven per pen; maximum age difference between calves in any pen should not exceed two to three months.

b. free stalls two to four months — 61 x 122 cm; four to eight months — 76 — 137 cm; eight to 12 months — 91.5 x 152.5 cm. Build free stalls all the same length and adjust to calf size with a headboard; stall widths should be made to fit a particular age group.

3. Watering devices
a. automatic cups preferred; keep clean;
b. top of drinking cup should be 50 cm from floor;
c. waterer should be at front corner away from feed in pens;
d. provide two automatic waterers when more than five calves are housed per pen.

4. Feeding devices
a. feed box for individual pens should be 20.3 x 25.4 cm and 15.2 cm deep;
b. group pens should have troughs of 25.4 cm wide, 15.2 cm deep and 61.0 cm long per calf; two troughs are preferred;
c. top of feed box should be 51 cm from floor.

C — Four to 12 Months

1. Feeding recommendations
a. if forage is 14-16 per cent crude protein, no supplemental protein is needed; however, vitamin and mineral supplements will be required.

2. Feeding devices
a. top of feed bunk should be 61 cm above ground for animals weighing less than 266 kg and 76 cm above ground for cattle weighing more than 266 kg;
b. depth of feed bunk should be 20 cm for grains and concentrate and 50 to 78 cm for silage or cut green forage;
c. bunks permitting feeding from one side only should be 46 cm wide for small animals and 61 cm wide for large animals;
d. if feeding is permitted from both sides, the bunk should be 91 cm wide;
e. allow the following feeder space per animal: small cattle — grain, 30.5 cm; forage, 45.7 cm.; large cattle — grain 45.7 cm, forage 61.0 cm.;
f. provide clean fresh water at all times; these animals should consume 37.8 to 56.8 litres per day depending on feed and climate; allow 30.5 linear cm of open water tank space for every 10 animals, or one automatic watering bowl for every 25 animals;
g. keep water from freezing by frequent changes or by installing heating elements **specifically designed for this purpose.** In the heat of the summer frequent water changes will prevent overheating.

3. Growing facilities
a. provide the following lot space: paved lot — 4.6 to 7.0 m^2/head; dirt lot — 9.2 to 13.9 m^2/head; combination — 7.0 to 9.2 m^2/head;
b. provide a paved area of at least 3 m around waterers, feed bunks, roughage racks, and entrances to sheds;
c. allow a slope of 2.1 to 3.9 cm per metre in paved lots and 3.9 cm or more per metre in dirt lots, depending on soil and climate conditions;
d. provide open sheds as shelters allowing 1.9 to 2.8 m^2 per head for small animals and 2.8 to 3.7 m^2 per head for large animals;
e. provide bedding, especially in shelters, to keep heifers dry and comfortable;
f. provide artificial shade allowing 1.8 m^2 for small and 2.8 m^2 for large animals; build shade 2.4 to 3.0 m high;
g. recommended fences for dry lot include wooden, woven wire, or pipe and cable fencing (127 cm high);
h. for better herd health and to aid in fly control, keep lots clean and dry.

D. General Management Procedures

1. Dip calf's navel in seven per cent tincture of iodine immediately after birth;
2. Dehorn and remove extra teats by three months;
3. At three to four months, vaccinate for brucellosis;
4. At six to seven months vaccinate for IBR, BVD and PI3;
a. consult veterinarian for complete vaccination program;
5. Separate bulls from heifers by six months;
6. Deworm heifers after six months (preferably after pasture season);
7. Treat for grubs between August 15 and November 17.

Diagrams that can be used as guides to some designs for calf and heifer housing and calf hutches may be obtained by writing the author at Box 232, Department of Animal Science, Macdonald College, Que., H9X 1C0.

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REPRODUCTION

AN AREA TO WATCH

by Sylvye Des Marchais and Robert Moore
Department of Animal Science

The reproductive performance of the herd is a major concern of most dairymen, as the failure of cows to conceive and reproduce is one of the principal reasons for cows being culled. In Dairy Herd Analysis Service (DHAS) herds during 1980, 17 per cent of the cows culled were eliminated because of reproductive failure. This was second only to low milk production as a cause of cow disposal. Among the economic losses caused by reproductive problems are prolonged calving intervals and the involuntary culling of high producing cows. Studies have suggested that a calving interval for a herd between 12 and 12.5 months is the most profitable. Also, with a higher level of involuntary culling, the genetic progress for economically important traits such as milk production is slowed down.

In a DHAS study of cows reported culled for reproductive problems in 1979 the season of calving had an important influence. Dairymen eliminated the most cows for reproductive failure among those that calved in the summer and early fall (July-October). The least number of cows were culled for reproduction problems from the spring calving group (March-June). These results suggest that the change of environment at breeding time for the spring calving cows — from inside the barn to outside and access to pasture — has a beneficial effect on the conception rate. In the fall, when it is time to breed the cows that calved during the summer, we see an opposite effect as the cows return to the barn. It has been shown that cows calving from summer on through the winter require more services per conception than those calving in the spring and early summer, a time when heat detection is easier.

This situation might be improved by giving the cows a chance to exercise regularly throughout the entire year. This practice is not very widespread among Quebec dairymen, with only 14 per cent having indicated, when responding to a DHAS questionnaire, that they sent their cows out for exercise during the winter. However, before sending the cows out one should take care to check the weather and the condition of the exercise yard to avoid injury to cows caused by slippery conditions. As well as giving the cows a chance to exercise, this exercise period allows the dairyman to observe the behaviour of the cows and watch for signs of heat.

In this same study it was also noted that the cows culled for reproduction were older and had a longer previous calving interval (16 days) than either cows culled for other reasons or cows remaining in the herd. Also, high producing cows were less often culled because of reproduction problems, even though they had longer calving intervals, required more services per conception, and had more days between calving and first service. The apparently contradictory results for high producing cows suggest that dairymen are more tolerant with high producers and will forgive their reproductive failings more than with a low producer. A question one must ask: to what point is a cow with reproductive problems worth the extra effort and trouble that she causes?

The advantages of artificial insemination (AI) are well known. However, the increasing use of AI has complicated things for the dairyman from the point of view of heat detection. He cannot rely on the bull to confirm or reject his suspicions. It is up to the producer himself to detect when the cows are in heat, and he faces the problems of irregular or silent heats. That this can be a problem is illustrated by the fact that in the DHAS questionnaire, 20 per cent of the breeders kept a bull and more than 90 per cent of them only used it on certain problem cows.

Also in the 1979 questionnaire, dairymen mentioned five signs that they look for when detecting heat. Some of them only mentioned one, while others use many of them.

Table 1. **Five signs in detecting heat**

Sign Observed	Per cent of Dairymen
Vulva, mucus	93.0
Mounting	85.0
Nervousness	61.3
Bellowing	53.3
Milk retention	22.6

One can see that the passing of mucus and a swelling of the vulva were the signs mentioned the most often by the dairymen. Mounting is another sign often mentioned, even though it is tied to the cows being let outside (with the exception of free stall barns). Bellowing and nervousness vary a lot from cow to cow, while milk retention is very irregular and is more difficult to observe with the modern milking systems. The dairyman must be very attentive in order to notice all possible changes in behaviour. A regular period of observation may resolve many problems.

The calving interval is directly related to the number of days between calving and the first breeding. The survey revealed that, on average, dairymen would start having their cows bred 60 days after calving. Some producers would have a cow bred as soon as possible (30-45 days) while there were others that would wait until 90 days after calving before having a cow inseminated for the first time. If there is a delay in the first breeding of the cow, there is a risk of lengthening her calving interval. It is desirable for a dairyman to have his cows checked by a veterinarian after calv-

ing and before breeding starts in order that any problem cows can be detected and treatment carried out as soon as possible. Table 2 illustrates how many dairymen were having this done when the 1979 survey was carried out.

Table 2. **Per cent of Dairymen Who Have Their Cows Checked Before Breeding**

	%
No Cows	38
Some Problems Cows	42
All Cows	20

Another tool that is available to the dairyman in his reproduction program is the pregnancy diagnosis. Done by the veterinarian, it can generally be carried out after 45 days of gestation. Too many producers believe that a cow is pregnant when she in fact is not, with precious time being lost. More than 90 per cent of the dairymen surveyed declared that they had used the pregnancy check, 57 per cent of these on a regular basis.

Finally, as with other management areas, good records are essential in order to record all the relevant reproduction information about the cows in the herd. This can include information on calving, visits and treatments by the veterinarian, early heats observed when the cow may not have been bred, breedings, and the results of pregnancy checks. Papers pinned to the wall in front of the cow that blow away with the first gust of wind have never been the key to success. Reproduction is an area that must be watched closely.

Reproductive Performance in Quebec DHAS Herds

by Sylvye Des Marchais
Department of Animal Science

Improving dairy cattle reproductive performance is a problem which concerns most dairymen. One approach to solving some reproductive problems is to compare reproductive management practices with dairymen operating under the same conditions. A two-year study of reproductive performance in Quebec Dairy Herd Analysis Service (DHAS) Holstein herds has recently been completed. Some of these results provide interesting information.

This study on reproduction in 172 herds was based on artificial inseminations reported between January, 1978, and September, 1980. Natural services recorded on DHAS reports for these herds were also included.

Reproductive performance was measured in four ways: number of days to first breeding, days open or days to conception, number of services per conception, and per cent conception. There was considerable variation in the level of reproductive success between herds. As might be expected, individual cows within herds also showed considerable variation in reproductive performance.

Days to First Service and Conception Rates

The average number of days from calving to the following first service was 80 days for the 14,817 cows in the study. Days to first service depends very much on the management decisions of the herd owner. The effect of days between calving and first service is shown in Table 1.

Conception rates on first service were highest (52.8 per cent) when the first service occurred between 70 and 90 days post calving. While conception rates are lower when cows are bred before 70 days, it is generally desirable to consider first services before 70 days post calving. Earlier first services can reduce the calving interval as Table 2 illustrates. In a British Columbia study, a herd of 85 cows was divided into two groups. One group was bred the first heat after 50 days post calving. The other group was bred the first observed heat after 80 days post calving.

The early bred group ended up with fewer services per conception and a much more desirable calving interval.

In the present study, the average number of days to conception was 109.6. This would translate into a calving interval of 393 days. Within this study population, 30 per cent of the cows had over 120 days to conception (or days open).

Table 1. **Effects of days between calving and first service on per cent conception on first service.**

Interval between Calving and First Service	Cow Population	Conception
up to 50 days	8.8%	41.0%
51–70 days	32.8%	46.1%
71–80 days	33.3%	52.8%
over 80 days	25.1%	51.1%

Table 2. **The reproductive performance of the two groups.**

	Breeding Groups	
	Early	Late
No. of cows	42	43
Days to first service	72	93
Days to conception	88	121
Calving interval (days)	373	404
Services per conception	1.50	1.95

Numbers of Services Per Conception and Conception Rates

In the study population, heifers required 1.54 services and cows 1.82 services per conception. These figures are based on heifers and cows that subsequently calved. It does not take into account animals sold for reproductive failures. The conception rate on successive services ranged from 49 to 55 per cent.

Service Sequence	Conception Rate
First	49%
Second	55%
Third	54%

Artificial insemination units normally indicate that their bulls have conception rates above 60 per cent. Artificial insemination units assume a cow has conceived on first service if a request for a repeat service has not been received in a 60-to 90-day period following service. Under these conditions, cows sold or rebred to a natural service are ignored in the calculations. The AI conception rates for individuals bulls are useful for comparing sires.

The Estrus Cycle and Repeat Services

There were 7,174 cows which had a second service within 45 days of the first service. Thirty per cent of these repeat services were requested within the periods of 6 to 17 days and 25 to 37 days of first service. These repeat services are outside the range of what is considered a normal estrus cycle. They are the result of poor heat detection, abnormal estrus cycles, or embryonic losses. Further research is underway to identify the frequency of these particular problems. A dairyman who regularly records observed heat periods and has a herd health plan where the veterinarian checks the cows before they are bred will usually have less repeat service problems.

The Service Sire and Conception Rates

The Quebec Artificial Insemination Unit classifies bulls on their ability to cause conception into three categories: low, average, and high. In this study the conception rates on first service for all bulls with 50 or more first services were compared. Conception rates for individual sires ranged from 43 to 54 per cent. This means, that, for whatever reason, sires varied by 10 to 11 per cent in their ability to cause conception.

The Maternal Sire and Reproductive Performance

Most reproductive problems are generally considered to be due to environmental effects, nutrition, health, management, etc. In this study, the daughters of sires differed in reproductive performance. Sire daughter groups had a range of 18.7 in days open (103.8 to 122.5) and 7.8 per cent in conception rates (43.6 to 51.4). In some cases a sire that displayed below average reproductive performance as a service sire also had a poor record based on his daughters' performance. This is an area that needs further investigation.

There is no simple answer to successful dairy cattle reproductive efficiency. However, good heat detection, records, a herd health program, and careful selection of service sires can go a long way towards improving reproductive performance.

Genetic and Environmental Effects on Reproduction in DHAS Herds

by Bruce Rutley
Department of Animal Science

Poor reproductive performance is costing Quebec dairymen millions of dollars annually. Consider that it costs $2.00 (1980, United States) per day in lost production and lost calves for delay in breeding beyond 85 days post-partum or that every day's delay in conception reduces milk yield by 12 kg. Note that reproductive failure accounted for 17 per cent of all cows culled in Quebec herds in 1980. When you consider the additional semen, veterinarian, and labour costs associated with poor conception and add this to the frustration of "problem breeders," it is not surprising that many Quebec dairymen consider reproduction their number one herd problem.

Achieving the ideal reproductive performance is no easy task but dairymen do have control over nutrition, herd health, and the heat detection factors which contribute to poor performance. Relief is now available for ovarian disorders such as persistent corpus luteum and cystic follicles, but what about post-partum anestrous and "silent heats?" Not even the best estrous detection program will detect heats that are not visible.

In an effort to aid in the improvement of estrous detection and herd reproductive performance, researchers at Macdonald are studying the genetic and environmental effects on reproduction. One objective of this research is to develop a routine and economical procedure to help identify and solve "problem breeders." The effect of management, estrous detection, days to first service, and housing systems will all be considered.

Cows from selected Dairy Herd Analysis Service (DHAS) herds will be sampled to determine milk progesterone levels to evaluate and predict the cycle patterns of winter calving cattle. Cows will be sampled starting at 20 days post-partum and then continuing until first breeding during the winters of 1982-83 and 1983-84. In addition, the Macdonald herd will be sampled for approximately 18 months. This sampling started in January, 1982.

Another objective is to evaluate sire effects on conception rates and estrous cycles. Heritabilities and differences of absolute milk progesterone levels between sires will be considered.

Improving reproductive performance requires an integrated management approach including good herd health, nutrition, and estrous detection. Hopefully, this study will add an economical and practical method of identifying estrous cycles in "problem breeders" to aid the dairyman in achieving his reproductive goals.

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The Somatic Cell Counting Service is Five Years Old

by H. G. Monardes and Dr. B. R. Downey, Veterinarian, Department of Animal Science

Five years ago last month, an individual cow somatic cell counting service was offered to herds on the Dairy Herd Analysis Service (DHAS) official program. Since that time, the service has expanded to include herds on the owner-sampler program, and total herds and cows on test have grown to approximately 3,500 and 120,000, respectively.

Cell Counts and Mastitis

Although it has been said many times before, mastitis continues to be one of the most prevalent and costly diseases affecting dairy cows. The National Mastitis Council in the United States has estimated that almost 50 per cent of all cows in herds without control procedures are infected with some form of mastitis in one or more quarters. The clinical form of the disease, in which a hot, swollen and painful udder with abnormal secretion is easily observable, accounts for only two per cent of the infected cows on any one day. The subclinical form, which is not apparent to the farmer, represents the larger single loss. Since the eradication of mastitis appears to be most unlikely, anything that facilitates control and peaceful coexistance with the disease is no doubt attractive to dairymen.

The cell counting service appears to be just such an aid. Interpretation of individual cell counts is not always easy since an elevated count does not always mean mastitis. However, substantial elevations do occur in response to irritation or injury of any kind to the mammary gland, and such trauma will often predispose to mastitis even though mastitis organisms were not the original irritant. Note that increased concentrations of somatic cells in milk are associated with calving and early lactation as well as drying off. The leucocyte fraction of the somatic cells are responsible for engulfing and digesting foreign materials such as bacteria within the mammary gland and are part of the body's normal defence mechanism. Therefore, their presence in moderate numbers is essential, although "normal" levels probably vary considerably among individual animals.

Cell Counts and Quebec DHAS Herds

In January, 1977, the cell counting service was offered to official herds on DHAS and in October, 1978, the service was expanded to include owner-sampler herds. At present, the cost of the service is $2.40 per cow per year. The growth in the number of herds requesting cell counts is reflected by the testing done in December of each year as outlined below:

Since dry cows are not tested, in excess of 125,000 cows were actually enrolled in the program at the end of 1981. While the average count for all herds on test in 1981 was in excess of 300,000 cells per ml milk, it is interesting to note the gradual but steady progress made by the original herds that were enrolled during 1977. These figures are summarized in Table 2.

It would appear that these dairymen are still managing to lower their cell counts even though most evidence suggests that they have already achieved very acceptable levels.

Cell Counts and Milk Yield

The National Mastitis Council has estimated that subclinical infection in one quarter reduces a cow's milk production 10-15 per cent. A comparison of milk produced by 2331 DHAS herds receiving cell counts for varying periods of time and 2698 DHAS herds not on the cell count program reveals some interesting facts (Table 3). Herds that have been receiving cell counts for

Table 1. **Herds and cows tested for cell count during December.**

Year	Herds	Samples Counted (Cows)
1977	256	8448
1978	1172	33943
1979	1590	46416
1980	2751	79747
1981	3482	105415

Table 2. **Average monthly cell counts of herds on continuous service since 1977.**

Year	Herds	Cell Count (000/ml)
1977	240	400
1978	296	347
1979	284	285
1980	264	268
1981	252	254

Table 3. **Average milk production and average cell counts in 2331 herds registered for the Somatic Cell Count Service (SCCS).**

Time on SCCS	Herds	Cells (000/ml)	Milk (kg) 1981	Increase in Milk (kg) 1979-1981
> 3 years	850	272	5714	179
2-3 years	479	274	5557	237
1-2 years	761	311	5435	259
<1 year	241	330	5398	229
Not on SCCS	2698	—	5348	153

Table 4. **Average milk production in herds experiencing increasing or decreasing average somatic cell counts (SCC) between 1980 and 1981.***

Change in SCC 1980 vs. 1981	Herds	Milk (kg) 1981	Increase in Milk (kg) 1979-1981
Decreasing	753	5675	231
Increasing	575	5635	159

*1328 herds had complete cell counts for all of 1980 and 1981.

greater than three years produced almost 400 kg more milk per cow in 1981 than did herds not participating in the cell count service. A significant part of this difference must be due to the program as evidenced by the increases in annual milk production since 1979 and by the proportional elevation in milk production with time on the cell count service. It does appear as though the major effect on both cell count and milk production can be accomplished within the first two to three years. It should also be noted that only official herds were on the program initially, and this fact may distort the data for herds with over three years of cell counts. Not all herds have shown improvement, however, and a comparison of 1981 milk production in herds with decreasing or increasing average cell counts between 1980 and 1981 is made in Table 4. As one can see, decreasing cell counts are associated with improved milk production when compared with herds experiencing an increase in cell counts.

Upon further examination, one can see that herds producing less than 5,000 kg per cow in 1981 had counts over 100,000 cells per ml higher than those herds producing over 7,000 kg during the same period (Table 5). In these 2331 DHAS herds, there is little question that low cell counts are associated with increased milk production (Table 6). Those herds with cell counts less than 200,000 produced over 500 kg milk per cow more than did herds having counts of 500,000 or greater.

Although milk quality has not been discussed here, elevated cell counts are detrimental to quality of the product and research at DHAS is continuing in this area. In several countries in the world, compensation to the producer is partially based on milk-solids other than fat, and such a practice would place even greater economic importance on milk quality.

Given today's milk prices, elevated somatic cell counts are costing the average dairyman a great deal of money. Assuming the causes of these high counts are correctable, the cost of detecting a problem would seem to be money well spent.

Table 5. **Relationship between average milk production and average somatic cell count (1981).**

Milk Production (kg)	Herds	Somatic Cell Count (000/ml)
>7000	108	233
6000-6999	555	260
5000-5999	1102	290
<5000	566	336

Table 6. **Relationship between average somatic cell count and average milk production (1981).**

Somatic Cell Count (000/ml)	Herds	Milk Production (kg)
<100	44	5932
100-199	605	5720
200-299	787	5614
300-399	493	5508
400-499	215	5328
500-749	163	5157
>750	24	4774

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MEGANTIC COUNTY

FOUNDING OF THE "EMBRYO TRANSFER CLUB"

During the last few years embryo transfers have gained a great deal of popularity. Unfortunately, a large number of producers embark on this technique without sufficient knowledge and thus make costly mistakes. Others, on the other hand, consider using this technique in the near future and follow very closely the latest developments and the results.

In order to better master this technique and to make it more accessible and less costly, progressive producers in Megantic County have decided to group themselves together by founding an "Embryo Transfer Club". In order to find out about this Club, which was established last January 27, and this technique, which has shown considerable development in that County, we met Marcel Lamontagne, President of the "Embryo Transfer Club", Marcel Vigneault, President of the Association of Progressive Producers of Megantic County, Théobald Jourdain, Regional Coordinator, and Denis Rémillard, Agronome at the local office in Plessisville.

But First Who Are "The Progressive Producers"?

Because they wanted to take advantage of the local resources, the producers in Megantic County founded four years ago an Association under the "Agricultural Societies and Dairies Act." Its name: "The Progressive Producers of Megantic County". They have as goals: the work of training members, of supplying them with necessary information (advice, lectures, courses), as well as supplying them with promotional material. They have chosen a logo which appears on all their documentation. They also have their own marketing agent who carries out transactions regarding more than 300 head of cattle per year.

Three years ago "the progressive producers" organized a luncheon program which had for its theme: embryo transfer. Despite the interest that this technique had created with many producers, nine months went by before one dairy producer, Fernand Fillion, tried the experiment. The result: an armful of embryos but not enough heifers ready to receive them.

"Donors Club"

Since they could not afford to lose embryos of exceptional genetic quality, the producers owning donors got together to organize a "Donors Club". The objectives thus envisaged are to avoid the loss of embryos and to use all the potential of a donor cow. The owner of a cow of very high value who wishes to take advantage of the embryo transfer will be limited by the number of animals in his herd that can receive the embryos. In getting together with other producers, he can carry out his embryo transfers and make his enterprise profitable. The producer who starts will see in this technique a means of obtaining purebred animals at a lower cost. He will also be able to rent his heifers and assure a higher revenue.

Mr. Marcel Lamontagne, producer and President of the "Embryo Transfer Club", owns a purebred cow of very high potential. She is 13 years old and does not calve naturally any longer, but she responds very well to the embryo transfer. Rather than getting rid of this animal, he foresees a possibility of obtaining a supplemental income by selling embryos.

This technique used with animals of elite qualities will, therefore, permit a more rapid genetic improvement in the conformation and production of dairy cattle.

Functioning of the Club

A member must inform the committee one month ahead of time as to the date of the embryo transfer in order to function as closely as possible with the natural cycle of the donor cow. He will indicate the number of heifers ready to receive an embryo and transmit the pedigree of his cow.

Later the message will be transmitted to the 25 members by telephone pyramid and by the weeklies in the area informing them that the "Beausoleil" farm wishes to carry out an embryo transfer on March 27. The aim of this procedure is to find heifers whose cycle corresponds with that of the donor's and have not received hormones. The owner of the receiver agrees with the owner of the donor on the buying of the potential embryo or the renting of the receiver. He also indicates if he has to conduct artificial means of cycling the animal. The first receiver-owner to offer his animal will be the first one to receive the embryo.

The Donor

Responsible for the result obtained by this technique, the donor must meet the objectives of a vigorous selection. Ideally, the donor is between four and 10 years old. This

permits one to know the animal well: ease of reproduction, the producing of calves of good quality, and free from disease. By its production and its conformation, the animal must be superior to the average of the herd. It has been noted that when the cow is in the period when she produces the most milk, she responds less well to superovulation. Consequently, one will ensure that the peak of production has decreased.

The Receivers

Nearly all breeds of dairy cows can be used, keeping in mind the size of the animal. The animal will preferably be a heifer whose weight and conformation corresponds to normal. While one cannot forecast the quantity of embryos that will be harvested, a minimum of eight receivers will be chosen for the embryo transfers.

Superovulation

One can obtain superovulation by administering to the animals hormones that will bring about the liberation of many ovules. It is planned for the 17th day of the cycle in order to avoid a natural heat which will come about on the 21st day.

The donor, who has received a series of injections to bring about superovulation, comes into heat on the morning of the 5th day. The ovules, which do not all arrive at maturity at the same time, will have to be fertilized three times at 12-hour intervals. For their part, the receivers will receive a hormone which will bring about the arrival of early heat.

The Collecting of Embryos

The producer supervises the success of each of the operations until the 17th day when he turns things over to the veterinarian.

All the operations are carried out by natural means. The harvesting of the embryos is accomplished by uterine washing which is repeated six to eight times. This method is simple and without risk to the animal and is easily carried out on the farm.

The liquid also obtained is placed in a cylinder in order to help in the decanting of the embryos. A 15-minute decanting period after the collecting is sufficient to permit them to reach the bottom of the cylinder. The veterinarian will collect the embryos which he will examine with the greatest of care. He will make sure that the room is sufficiently warm (25°C) and clean.

From left to right: Théobald Jourdain, Regional Co-ordinator, Marcel Lamontagne, President of the Embryo Transfer Club, Marcel Vigneault, President of the Progressive Producers Association of Megantic County, and Denis Rémillard, Agronome at the local office in Plessisville.

Evaluation of the Embryos and the Receivers

The veterinarian determines the age and the potential quality of the embryo before proceeding to the transfer. By feeling the receivers, the veterinarian will ensure the date of ovulation and determine which ovary has produced the ovule. If the receiver has ovulated at the same time as the donor, the veterinarian will transfer the embryo. The transfer is carried out when the embryo is five to six days old. It is only 45 days after the transfer that the veterinarian will verify the number of pregnant heifers.

For Whom is this Method?

Even though embryo transfer is accessible to any producer, before investing time, money, and energy the producer should examine other points which might be more important to consider (better management, tile drainage, increase of yields in fields, ventilation of buildings). One must not forget that this technique permits the improvement of the herd by using the latest genetic discoveries.

For a starter, buying an embryo could be a good investment, hoping, however, to have a heifer. One estimates the cost to be approximately $525 for one pregnancy without taking into account the in-

Louise and Fernand Fillion, owners of the Nandcel farm at St-Anastasie, stand with pride near their great donor.

semination and the costs of the visits which the preparation of the animals entail.

The NANDCEL Farm

We visited the farm that Fernand and Louise Fillion operate together. They have obtained marvellous results to date. Two transfers have resulted in the recovery of 44 embryos of which 33 were transferred. Twenty-one heifers have been diagnosed as being pregnant. Luck has been good to them as they obtained 13 females and eight males.

After having started alone in 1971, after having amalgamated with his neighbour in 1974, Fernand Fillion finally bought out his neighbour's share and affiliated with his wife in 1980. He has succeeded in making his herd go from 85 head to 65 head while filling the same quota which has contributed to having his production go to more than 7,200 kg of milk per cow on average.

He owns three silos, two of which are for hay and one for high moisture corn on the cob. The cows are in a free stall system. His objective is that calving will take place around 25 to 26 months. His annual quote is at 517,000 kg of milk and his area under cultivation consists of 350 acres.

Embryo transfer is for Fernand Fillion the means of ensuring a purebred herd in a relatively short time and of obtaining income from the sale of quality animals on the local, national, and even international market.

What are the Possibilities for the Future?

Of course, exports are kept in mind. If the genetic potential of the Quebec dairy herd continues to increase, and if the annual average production jumps by 1,350 kg, the exterior demand for excellent animals will be even greater. Other hormones are also thought about which will permit a higher rate of conception, embryo freezing, and the determination of the sex of the embryo. For the "Embryo Transfer Club", the important part is not to sell abroad but to ensure above all that the producers have an elite herd.

RESULTS OF THE SOCIO-ECONOMIC CONFERENCE ON THE APPLE INDUSTRY IN QUEBEC

In order to promote the consumption of products based on apples, the creation of an Apple Industry Council is being considered. Its general mandate will be to explore and identify the market needs for the fresh state as well as the processed.

This is one of the main points that came out of the socio-economic conference on the apple industry which was called together on the 4th and 5th of February by the Minister of Agriculture, Fisheries, and Food of Quebec in order to establish a plan for the rebirth of the apple industry which was hit very badly by the winter frost of 1981 which brought about the death of 15.3 per cent of the apple trees.

The Apple Industry Council could be composed of producers, processors, packers, dietitians, consumers, and marketing specialists.

The Council will be able, once the demand has been well identified, to resolve various problems which are related, near or far, to marketing — either the presentation of the product, the different volumes of containers, the identification of the product, nutritive qualities, etc.

In addition to the creation of this new Council, the members present at the conference were able to agree on many other subjects which are open to scrutiny in order to bring about a real re-development of the Quebec apple industry.

Production and Processing

In spite of some different points of view, the producers and the processors have agreed to make certain studies to determine whether it is preferable to produce apples for processing or for the fresh market.

The demand for processed products increases from year to year, whereas that of the fresh market remains relatively stable. The producers state that, at the moment, their desire is to produce for the fresh market. Thus, if one wants to avoid an important part of the market being lost to Quebec producers, it is important that measures be taken to ensure that processors receive sufficient supplies of apples.

The producers, however, worry about the great fluctuations in the prices that they receive from the processing plants. This is why they are reticent about encouraging the production of apples for processing. The participants have, however, decided to study some mechanism of price regulation.

Specialization or Diversification

As well, participants at the conference studied the troublesome question of the diversification of apple varieties.

In a few words: should we try to satisfy all the tastes in producing many kinds of apples or rather specialize in the production of McIntosh, leaving the other varieties that are in demand to be imported.

The question is asked. The Ministry of Agriculture, Fisheries, and Food is ready to undertake a study on the comparative advantages of the two possibilities in terms of feasibility and profitability. The same point comes about in the choice of varieties and rootstocks. The Ministry will draw up the results of the experiments carried out by the producers, taking into account the criteria of resistance to frost, fungal diseases, etc.

Price Fixing

Most of the discussions on the theme of distribution were on the problems of determination of prices at different levels of marketing. Currently, the committee on price fixing determines a minimum price to the producer which, when it is increased by 12.5 per cent, becomes the minimum price to the retailer.

Most of the participants have mentioned several inconveniences which result from this practice. That is why there will be advantage for the more interested parties to carry out some consultation in order to improve the formula of price determination. Among other things: should a minimum price be fixed for the retailer?

This Month with the QWI

A Special Home

The Wyman branch in Pontiac County was invited to hold a meeting at the home of the late Miss Sophia Armstrong. Miss Armstrong was the first Provincial President of the Quebec Women's Institutes and was the first Pontiac County President. The present owners of the home are Mr. and Mrs. Garry Graham.

Mrs. Violet Poole, County President, was present at the meeting and read two very interesting articles on the life and work of Miss Armstrong.

The house, which was built in 1883, has been modernized, but some of the members remember it as it was before electricity or modern conveniences. Mrs. Graham feels it is a heritage home for the WI in Pontiac County. The sketch of the house as it is today is by a local artist who is a member of the Bristol WI. The photo shows the house as it was many years ago.

Celebrating 70 Years

Mrs. Murray Mason, County President, invited the Cowansville branch to meet at her home to celebrate their 70th anniversary.

A long table was set up with old fashioned dishes and the centrepiece was a large bowl of red and green apples. Each member brought casseroles, salads, and rolls. The dessert was a beautiful carrot cake made by Mrs. Mason and served with ice cream and cranberry sauce.

A short meeting and a food sale was held in the afternoon. Mrs. Bidner thanked Mrs. Mason for her hospitality. The dinner and celebration was enjoyed by all.

A Warm Welcome to New Members

One of the pleasures of reading through the reports each month is learning that a branch has welcomed a new member or members. Several branches reported new members recently with **Ayer's Cliff** leading the way with five new members. Congratulations! Louise Perkins was welcomed by **Cleveland; Restigouche** welcomed back a former member, Mrs. Evelyn Adams, and **Melbourne Ridge** welcomed Mrs. Grace Johnston. Don't forget to let Mrs. Kilgour, Provincial President, know about your new member(s) so that she may greet them. This is something she particularly likes to do.

Dessert Card Party

Missisquoi County held a dessert card party last October in Dunham. A great assortment of desserts, tea and coffee was enjoyed. There were 11 tables of 500 and four of bridge. Prizes were given for high and low scores, and there were door prizes which were mainly food items donated by members of the four branches.

This dessert card party has been an annual event now for a few years and is an enjoyable way to raise money for the County treasury.

Dear WI Members:

The last batch of reports brought us up-to-date on events over the past few months.

Ever mindful of the fact that we are part of a larger organization, several branches mentioned ACWW and included it in their programs. At a recent meeting of the **Lachute WI,** Mrs. Ethel McGibbon spoke about Dorothy McGregor, former honorary treasurer of ACWW. She held the post for 25 years and was a much loved friend of everyone who knew her. This was one of the many interesting programs held by this branch of late. A senior member of **Frontier** told of her trip to Scotland to attend the ACWW Conference in 1959. There were 50 Canadian women and four men from all parts of the country who met in Montreal to sail by boat to Liverpool, England. She shared pleasant and humorous memories of the trip and recommended attendance at one of these Conferences. The next one will be in Vancouver in 1983. Closer to home, May 1 was the date set for the Mother's Day Tea and Bazaar to be held at Cushing in St. Mungo's Church Hall.

Pennies for Friendship are always collected at tea time in all **Compton County** branches — seems an appropriate time! **Fordyce** gave one penny for each inch of waist to Pennies for Friendship, and at another meeting, five cents for every clock in the home. The ACWW flag was on display at **Belvidere** and a donation was made.

Christmas was in the minds and hearts of all. Gifts for a family of "boat people" were brought in to **Pioneer's** December meeting. Several branches in Argenteuil remembered the residents of the St. Philippe Home at Christmas. **Grenville** was one to bring cheer to the dear people and I quoted from the report. Each person received a bag of goodies plus a present of their choice. Santa again visited with his merry "Ho-ho-ho" which brought tears to the eyes of many. Thank you again Santa. Try to remember, especially at Christmas time that "Love isn't love, till you give it away."

Dalesville Louisa brought in Christmas items for a needy family. **Brownsburg** sent a donation to help bring Christmas cheer to patients at the Douglas Hospital. Members also donated goodies for the children at the Rosemere home, and each member at **Jerusalem Bethany** had a wrapped gift for them.

Matapedia members, having enjoyed a Christmas dinner and party for members and guests, are busy selling tickets on an afghan. **Stanbridge East** remembered the Douglas Home Christmas gift program and gave Christmas donations to the Dixville and Butters Homes. **Beech Grove** made Christmas baskets using old Christmas cards and decorated them with fancy yarn or embroidery. The baskets were used to hold fruit and other goodies for shut-ins, the eldery, and the lonely in the community. **Spooner Pond** brought in gifts for the Douglas Hospital. Roll call for **Granby West** was "A Christmas tip or a Christmas recipe." As so many other branches did, **Waterloo-Warden** members took gifts to shut-ins. They also made inquiries as to what they might give to the Waterloo Hospital that would be of use to the patients. A hair dryer was suggested. Jams, jellies, pickles, oranges, and grapefruit were handed in for the Grace Christian Home by **Belvidere** members. Eight Christmas baskets were delivered and 75 bags of candy provided for the community Christmas tree by **Brompton Road,** who also sent a crate of oranges to the Wale Home. Very similar figures were reported by **Milby,** who received 13 thank-you notes for Christmas cheer.

All **Stanstead County** branches made up gifts for sick and shut-ins. **Hatley** sent donations for Christmas to Maplemount Home, Butters Home, the Dixville Home, and the Stodard Home for seniors. Hatley observed Christmas in a unique way. In a group they attended the Anglican Church Christmas tea and sale. **Beebe's** roll call was a gift for the Dixville Home for retarded children.

Part of one program at **Brownsburg** was a good "Sing along with the new QWI song book." At **Arundel** an article written by Frank Lowe was read by Hazel Thomas, Education Convener. Mr. Lowe quotes Mr. Jack Taylor who deplores the view that one fades with age, stressing the myth that at the age of 65 one should immediately retire before one falls apart mentally! How misguided are the employers who select an employee primarily on the basis of youth, quite disregarding the value of experience in an older person. He points out that many of the world's great achievements were by people over 65 years of age.

It might be interesting to hear more about what is said at a Lemons and Laurels discussion. One was conducted by Mrs. K. Hanley at **Upper Lachute East End. Brownsburg's** members were asked to bring a guest and a Valentine to the February meeting. At **Jerusalem Bethany** Mrs. McGibbon gave a report on the 4-H Banquet that she had attended. In her remarks she mentioned what a capable group these young people are and how well the evening's program was conducted. A successful garage sale and a successful card party were reported on by **Inverness.** One program at **Kinnear's Mills** had three "brings" in it: Bring a recipe for pickles; bring a greeting card for the Health and Welfare Convener, and bring an article old or new to stump the members as to its use. Brought in were: a turkey bell, tongs to remove toast from a toaster, a picture stand, and a maple syrup stirrer.

An interesting part of a program at **Dunham** was a questionnaire on the crests and premiers of the provinces which was held by Mrs. Dorothy Paterson. This branch's Mrs. Ruby Sherrer was presented with a 25-year pin. A first for **Spooner Pond** was having lunch out at a restaurant. It was enjoyed by all and heartily recommended. The local MNA and his wife were guests at **Shipton** on one occasion and County President Shirley Johnson was guest of honour at their annual pot luck supper. **Richmond Hill** members were very proud of Mrs. Nellie Wallace who is 83 years old and received the cup for the best embroidered quilt block in the inter-branch competition. **Melbourne Ridge** was pleased to present Mrs. Ethel Adamson with an Abbie Pritchard Throw.

Richmond Young Women were busy handing out trophies and plaques: a trophy for the best woman driver of a two horse hitch heavy draught team at Richmond Fair; two plagues, one for each boy and girl with the most overall points in the Richmond Expo Community Children's Fair; two trophies for the youngest male and female "ploughperson" in the St. Francis Ploughing Match. If one may be forgiven a pun, the following from **Granby Hill** is food for thought: two out of three will go to bed hungry, in some areas, and pray for food while others will pray for guidance to keep on their diet another day. **Belvidere's** Citizenship Convener held two contests: guess the number of pennies in a glass jar and name the objects on a tray after a brief glance. The pennies were given to UNICEF. **Waterloo-Warden** also guessed the number of pennies and the winner received a prize.

Port Daniel forwarded $678 to UNICEF and Marcil sent $406.65. **East Clifton** gave a Hallowe'en party for the children. They were served supper and treats and later played games. **Canterbury** gave a donation to the school cafeteria for the Hallowe'en dinner.

Ascot's Mrs. Pearson conducted a very thought-provoking program on the Bill of Rights. At another

meeting they learned about school board legislation, legal aid, and the news regarding the Ascot name change. **Beebe** held a short but beautiful Remembrance Day service at the Beebe Park Memorial Gates and laid wreaths.

A variety of topics were chosen by guest speakers such as Mrs. Louise Massicote, a notary, who spoke to **Grenville** about bills, laws, and wills.

Several branches heard talks such as this one by Ian Evans, Director of Adult Education of the Laurentian Regional School Board who spoke to **Arundel** about the Adult Literacy Program which is run on an "Each One, Teach One" basis with volunteer helpers. The program is personal and confidential and several of the members are interested in attending a training course so that they can offer their services if the need arises. **Marcil's** guest speaker, David Royal, on behalf of the Literacy Council, described the Frank LAUBACH method of teaching reading skills to adults. This method, started 10 years ago with one council in Lunenburg, Nova Scotia, is now used in 88 countries and in 144 languages. All members work on a voluntary basis. Three members of the Marcil WI have been trained in this field, and one of them, Sheila Clinton, gave a sample lesson. **Stanbridge East** had Mrs. Juel Weideman explain the method of teaching adults to read at a recent meeting. They also had Mr. W.D. Duke and Mr. Jim Goulé, chartered accountants from Cowansville, speak on income tax laws, RRSP's, banking laws, income splitting, capital gains, gifts, succession duties, estate planning, wills, and farm roll over from father to son. **Gore** is another branch that heard about the LAUBACH literacy program.

Compton Road had a guest from Coquois, Ontario, who gave a talk on the work of her branch and presented then with a woven towel. Miss Doris Pitman, a sister of Mrs. Sterling Parker, **Lennoxville's** President, was a guest speaker at the December meeting. Miss Pitman is a missionary in Angola and related some of her experiences of Christmas in Africa. She explained how what would seem so little to us meant so very much to the children at the mission. Her talk was thought-provoking and inspirational, bringing to mind in the midst of the hustle and bustle of the season, the real meaning of Christmas.

Sawyerville entertained the five other branches of Compton County. Lennoxville WI was also invited as Mrs. Sterling Parker, QWI 1st Vice President and a member of Lennoxville, was invited to speak. She told members about the FWIC Board meeting she attended last June in Ottawa and, as we have been twinned, discussed the similarities and differences between Newfoundland and Quebec. She had several articles for display on FWIC and ACWW. **Marcil** reports that great interest is being shown in Newfoundland since our province is twinned with them. Two of the members have visited there and one displayed pictures from her trip.

The Year of the Disabled was remembered by most branches throughout 1981. Here are a few recent reports: **Grenville** held a card party for the disabled in November. **Upper Lachute East End** gave Christmas gifts to handicapped children as well as to the children's home in Rosemere. **Inverness** gave a special donation to the War Amputees for the Year of the Disabled. **Dennison Mills,** who reported many different donations, also gave to the War Amputees. They had a table at the Richmond Farmers Market and at the Richmond Legion Flea Market and the proceeds went to the Dixville Home. A Roll Call of **Granby Hill's** was "Tell how a person has overcome a handicap." Mrs. Down, a teacher of handicapped children was a speaker at **Hatley's** November meeting, and **Stanstead North** had a public evening dinner and invited as guests area handicapped and their escorts.

An appropriate Roll Call for the season was from **Dalesville Louisa:** "Bring a homemade Christmas decoration for exchange." **Brownsburg's** asked "How to brighten your kitchen?", and **Kinnear's Mills** asked members "to tell of one bad habit they would like to break." **Fordyce** asked members to "name an event in which you participated that made you the happiest during the past year. Another of their roll calls was to name a wild plant that you can eat. Pigweed, dandelions, fiddleheads, cowslips, milkweed, lamb's quarters, catnip, and mint were some that were mentioned. "Bring a recipe for auction" was one of **Beech Grove's** Roll Calls. Some recipes brought as much as 50 cents each when read and the bids started to flow. It would have been interesting to read some of the answers to the roll call at **Gore:** "What future does a farm child have?" **Granby West's** Roll Call was "Name a project you would like to complete in 1982." Wonder if they are going to ask the members in 1983 if they did?

A good and interesting collection of mottoes to choose from this month. From **Pioneer:** "The hardest thing in the world to open is a closed mind." **Compton County:** "No nation is so poor that it cannot afford free speech," and "The more you say, the less people remember; the fewer the words the greater the profit." From **Inverness:** "The manner of giving is worth more than the gift." It was hard to choose from the mottoes from Missisquoi County. Here are a sample: From **Dunham:** "Some books are to be tasted, others to be swallowed, and a few to be chewed and digested," and "Never argue with your doctor; he has inside information." From **Fordyce:** "This is definitely a woman's world. When a man is born people say, 'How is the mother?'. When he marries, they say 'what a lovely bride,' and when he dies, they say, 'how much did he leave her?" And from **Stanbridge East:** "Learn to pause or nothing worth while can catch up with you." Also from **Fordyce** was "Patience is something you admire in the driver behind you but can't put up with in the driver in front of you." From **Granby Hill:** "Kindness cannot be given away; it always comes back." "Swallow your pride; it's not fattening," was **Waterloo Warden's** as was "If you can't have the best, make the best of what you have." Finally, **Cowansville's** motto: Two things are bad for the heart — running upstairs and running down people.

Most branches mentioned the death of Mme Therese Casgrain. Many took time to go over some of her remarkable accomplishments.

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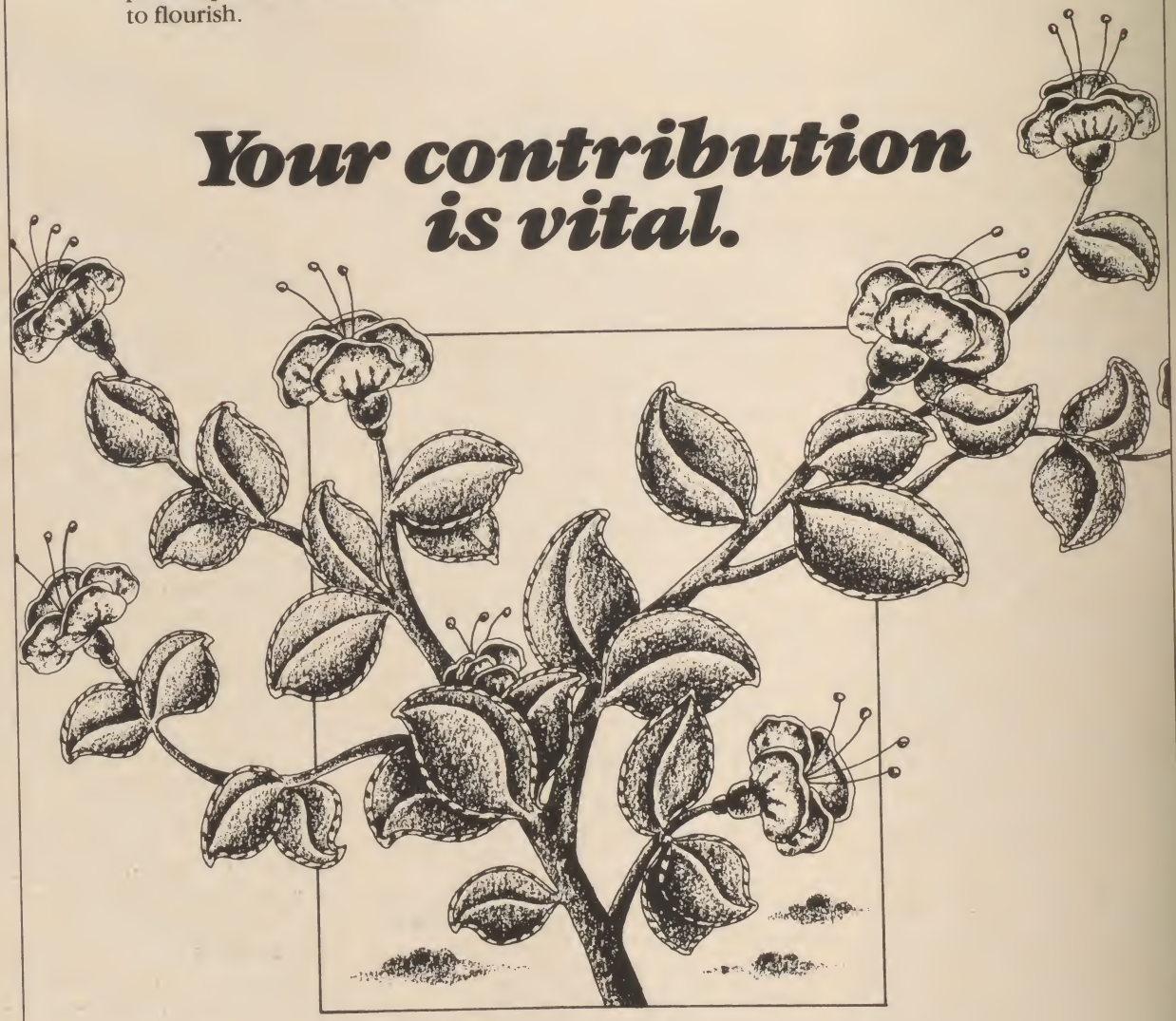

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